

REMARKS/ARGUMENTS

The Examiner's attention to the present application is noted with appreciation.

Claims Amendment. Claims 1, 13 and 16 are amended to provide that in the EGR system the exhaust gas is filtered such as by a diesel particulate filter, *before* the exhaust gas is cooled. Support for this amendment is found throughout the specification; see, e.g., Fig. 1 (diesel particulate filter 52 is upstream, or before, EGR cooler 54) and specification at page 5, lines 26-30. Claim 11 is amended to provide that that the cooler is an air/air charge cooler that cools the mixture of intake air and exhaust gas subsequent to compression. Support for this amendment is found throughout the specification; see, e.g., Fig. 1 (air/air charge cooler 62) and specification at page 3, lines 17-18 and page 6, lines 18-19.

Claims Rejections – 35 U.S.C. § 102. Claims 16-17 and 19 are rejected as being anticipated by Woollenweber et al. This rejection is respectfully traversed.

As amended, independent claim 16 provides that the exhaust gas is filtered, such as by a diesel particulate filter, *before* the exhaust gas is cooled. *See* second limitation, amended to provide in part “maintaining a pressure of filtered cooled exhaust gas produced by the engine, which gas has been previously filtered...”

Woollenweber et al. disclose filtration of the exhaust gas by trap 41 *after* it has passed through EGR cooler 45 (see Figs. 3-6). The inventor has discovered that it is advantageous to filter the exhaust before it is cooled, because the filter efficiency is dramatically increased at higher temperature. This is especially important in the context of the present invention, since the

EGR particulate level must be very low in order to avoid damage to the rotating compressor wheel.

Because Woollenweber et al. disclose only exhaust gas filtration means of a “trap” at a point *after* it has passed through an EGR cooler, Woollenweber et al. does not anticipate. A section 102(b) rejection may be maintained only if the reference teaches every element of the claim. See, e.g., *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.”).

Claims Rejections – 35 U.S.C. § 103. Claims 1, 3, 5-9, and 11-15 are rejected as being unpatentable over Gladden et al. in view of Woollenweber et al. Claim 4 is rejected as unpatentable over Gladden et al. in view of Woollenweber et al. and further in view of Coleman. Claim 20 is rejected as unpatentable over Woollenweber et al. in view of Gladden et al. Such rejections are respectfully traversed.

As amended, independent claims 1 and 13 provide that the exhaust gas is filtered, such as by a diesel particulate filter, *before* the exhaust gas is cooled. *See, e.g.*, the second and third limitations of claim 1 as amended, now providing: “a diesel particulate filter disposed to filter the exhaust gas before the exhaust gas enters the compressor; and an EGR cooler disposed to receive filtered exhaust gas from the diesel particulate filter before the filtered exhaust gas enters the compressor.”

As discussed above, Woollenweber et al. only disclose filtration of the exhaust gas by trap 41 *after* it has passed through EGR cooler 45 (see Figs. 3-6). Woollenweber is cited in the section 103 rejections for the proposition that “it is conventional in the turbocharged internal combustion engine art having the exhaust gas recirculation system, to utilize a diesel particulate filter (41) to filter the exhaust gas before the exhaust gas enters the first plurality of blades (See Figures 3-6).” However, as amended independent claims 1 and 13 require that the exhaust gas first be filtered, and only subsequent to filtering be cooled by means of the EGR cooler.

Placement of filter prior to the cooler results in improved functionality, because the filter efficiency is dramatically increased at higher temperature. This is especially important in the context of the present invention, since the EGR particulate level must be very low in order to avoid damage to the rotating compressor wheel.

No where in the cited prior art is there any teaching that a particulate filter should be placed upstream of the cooler, nor is there any motivation or reason suggested in the cited prior art to place the filter upstream of the cooler. In the absence of any motivation or teaching, placement of the filter upstream of the cooler is not obvious. *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984) (“The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant’s specification, to make the

necessary changes in the reference device.”). This is particularly true where, as here, placement of filter prior to the cooler results in improved functionality.

None of the cited references disclose or suggest the required element of the present claims, as amended, of cooling the exhaust gas after it has been filtered. Thus the combinations of references do not teach each and every element of the claimed invention. Further, as discussed above, such required element is not obvious over the prior art, whether cited singly or in combination.

In view of the above amendments and remarks, it is respectfully submitted that all grounds of rejection and objection have been avoided and/or traversed. It is believed that the case is now in condition for allowance and same is respectfully requested.

Should the Examiner have any comments, questions or suggestions relating to a speedy disposition of the application, the Examiner is invited to telephone the attorney of record, Ephraim Starr (Reg. No. 41,325), at (310) 791-9120.

Respectfully submitted,



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